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SUPERVISED STUDY IN THE UNIVERSITY OF CHICAGO HIGH SCHOOL¹.

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Supervised study is the directed school activity which has grown out of the recognition of the fact that there are individual differences in pupils. The University of Chicago High School has seriously attempted to deal with this problem of individual differences. There are two distinct phases of this movement, both coming properly under the head of supervised study. The first phase is that of supervised study within the regular recitation period. The periods are 55 minutes in length, and each teacher is at liberty to use his discretion in the employment of a certain part of this hour to particular supervision of his class at study.

The second phase, and that which will be dealt with exclusively in this article, is that of the "study class." Study classes are maintained definitely, with a regular place on the school program, and with a regular teacher of the department in charge, by the mathematics, French, German, and English departments. This article will deal with each of these study classes, but will naturally go into more details in discussing the mathematics study class, of which the writer has had charge during the past year.

We do not feel, however, that the title of this article is misleading, because what has been done in the mathematics study class can with suitable adaptation be applied to study in any department. The mathematics department is unanimous in agreeing that the study class is the best solution they have

¹ A paper read before the mathematics section of the 1918 Conference of Secondary Schools Affiliated with the University of Chicago.

found in dealing with particular pupils, and is desirous that the technique of handling such a class be passed on to others who may benefit by or improve on it. The writer himself wishes to disclaim any particular credit for the report he makes, since much of the detail was inherited by him on assuming charge of the work and much also has been contributed by his colleagues in the department.

The class and the pupils.—The high-school day consists of seven hours, six of which are devoted to regular classroom recitation work. The sixth hour ends at 2:40, and the seventh hour is for most pupils a free hour, during which time many of the social activities of the school take place. These include the Literary Clubs, the school orchestra, various technical clubs, and, during the past year, Red Cross work. On Monday this hour is used by the faculty as consultation hour, at which time parents are invited, or, at times, especially requested to meet the teachers for consultation. It is during this seventh hour that the study classes are held, namely from 2:40 to 3:40. At the close of this hour it is still early enough for dances and athletic contests, which never begin until 3:45. A pupil who attends the study class, therefore, may miss a meeting of his Literary Club but is at no time deprived of any athletic competition in which he may desire to take part. The wisdom of this will be recognized immediately by most schools which are accustomed to having their best athletes be the ones who, because of time devoted to athletics, are especially needful of supervised help. Athletics have never yet so monopolized the time of our pupils that they have endangered their standing, but provision has at least been made for their time requirement.

At the beginning of the school year one finds two distinct attitudes existing toward the study class. To some and in fact to most of the pupils it seems a place for "boneheads"; and it has even been dignified by the name "Bonehead." "I can't, I

have to go to 'Bonehead' " comes to be a familiar expression. The other, and much less prominent attitude, is that the study class is a place to go when in need of help—a veritable hospital and sanitarium for the afflicted.

Naturally these two attitudes are held by two types of pupils. The first are the "sent" pupils, students who *have* to go and who have certain things to do. The second are the pupils who come voluntarily to the class to clear up difficulties, to learn how to study, and to make up work they have missed by absence.

At first the ones "sent" are in a large majority; the others feeling that going to "Bonehead" is a confession of weakness. This attitude is hard to combat and even at the end of the year does not entirely disappear. Before I deal with that side of the question I shall make clear what I mean by being "sent."

The department has a standing agreement with itself that as soon as any pupil shows marked weakness, or in case a pupil does not grasp a particular portion of the work, he must attend study class. The supervisor is informed of this and keeps a record of the attendance of the pupil. This detail will be spoken of later. While the pupil is with the supervisor he does work assigned him either by the supervisor or by his particular teacher; and when the teacher is satisfied that the pupil can proceed without this extra help he is released from study class. In no case does the supervisor release a pupil, nor does he, except in exceptional instances, excuse a pupil for a single period.

Of course being compelled to go makes a pupil want to get out of the class. Having the seventh hour definitely filled *every* day and being allowed to take advantage of the class *when he wishes to* are two entirely different things. So long as pupils are "sent," just so long must there be a certain aversion to the study class; and undoubtedly there will always be some who must be sent. The problem then is not so much to

make the pupils love the class as to expedite their leaving. The supervisor, however, will be wise to make things as pleasant as he can for his charges, for all pupils work best when they find things interesting and agreeable and when the authority holding them to work is hidden by a desire to help them.

The supervision.—Let us turn now to the actual supervision of the study class, dealing with the various situations met there and explaining what experience has taught us to be the best mode of procedure. If this article seems to go into too great detail, it need only be said that details must be met, and those interested in this type of work are more interested in particulars than in generalizations. In case a pupil is “sent” to the study class by his teacher he must have a fixed piece of work to do; something definite and purposeful, and not something given him only for the purpose of keeping him busy. A pupil soon learns whether he is being given “busy work” or being helped; and if a study class is to be a success it is imperative that the pupils leave it each day feeling that something has been done for them.

Pupils “sent” belong almost entirely in one of the following classes: (1) Those who have been absent for such a period of time as materially to interfere with their work. (2) Pupils who have failed in some particular portion of the work and who must make this work up in order not to be a source of weakness in the class. (3) Those having minor difficulties, involving only a portion of the work: transients. (4) Those who are naturally weak; who need to be helped along each day and who should be shown how to study.

These pupils present four distinct problems and must be dealt with individually. In order to facilitate the handling of each pupil a printed blank is given him each day on his entering the room. This blank, reproduced below, serves a double purpose. It gives the supervisor information about the pupil and enables him in a measure to “place” the pupil. It also

serves as an attendance check for the pupil's teacher, and lets the teacher know what the pupil has done. The slip is placed in a particular drawer in the appropriate teacher's desk, and each morning the teacher checks the attendance of the day before. He leaves the slips where he finds them. In the afternoon the supervisor collects them, replacing them with the new slips of the day. Enforcement of attendance is left in the hands of the individual teacher. This is not a difficult matter. We have found that pupils attend regularly.

The blank here reproduced is the one found to give most satisfaction after several trial blanks were experimented with. It calls for a minimum of information, but gets all that is necessary:

STUDY CLASS RECORD

- 1. Name.....Date.....
- 2. Teacher.....
- 3. Were you sent?.....
- 4. Work done here: state carefully, giving pages and problems.....
.....
- 5. If you leave before end of hour make (X) here.....

The information secured as to work done is classified by the supervisor. He soon finds that there are certain typical difficulties; certain places in the course which require specific and careful treatment; certain common mistakes not foreseen even by the experienced teacher. This information is being preserved, together with the supervisor's and the department's recommendations with regard to each problem, and will be published for the benefit of those schools particularly who use the same texts we do¹. We feel, however, that much, if not all, of the information gained will be of benefit to high-school mathematics teachers in general.

¹ We say for users of our texts in particular because we use Breslich's Correlated Mathematic Series, and consequently meet many problems which differ from those met in ordinary mathematics courses.

Let us now consider the procedure with regard to the "sent" pupils. Those in class 1 are easy to handle. They know that they have a definite amount of work to make up. The only problem for the supervisor is the assigning and directing of this work, explaining where explanation is necessary, and seeing that each step is understood before the pupil proceeds. Of course if a pupil has been out more than two weeks, or if he has missed a sequence of lessons involving detailed explanation, the study class cannot deal with his case completely, and some additional help must be given by the individual teachers or by special private teaching. Private teaching, or tutoring, at all times is discouraged and an effort is made to have the pupil receive sufficient aid in the study class to be independent of this.

Class 2 includes pupils who may be among the leaders in their respective classes and yet find certain portions of the work of particular difficulty. They may, on the other hand, be pupils who have been loafing. In either case the treatment is obvious. The supervisor has two problems: first, to see that the pupil does not fail in the work he is doing in class at the time; and, second, to see that the work in which he has failed is satisfactorily made up. Such a pupil spends at least half his time in the class preparing his work for the next day, the supervisor directing, assisting, or criticizing as needed. The last half of the pupil's hour is devoted to "making up" work in which he has failed. The supervisor must know just what this is, must remember it from day to day, and must be able to direct this study confidently and definitely. It is with this pupil that he must be careful, lest the pupil feel he is merely being "kept busy."

Class 3 is large, and here are found most of the pupils who come voluntarily. Here also the supervisor finds his most varied problems and must be most alert. These pupils should learn to look on the study class with respect; and they will, if

the supervisor can, with a few well-directed questions or suggestions, at once go to the heart of the problem in which the pupil is interested. Such pupils do not want to stay during the entire hour; they should be helped and allowed to go as soon as their difficulties have been cleared up.

Class 4 it is, however, that presents the big problem that forms the backbone of the study class and, like the poor, is always with us. Some of these pupils are in the class day after day for a month or more. They must receive systematic treatment, and in order that this be given them they must be studied by the supervisor. He must talk with the pupil, with the pupil's teacher, and must watch the pupil's work carefully. He should get on good terms with the pupil and let him feel that he is actually interested in him. He should even make the pupil feel, in a sense, responsible to the study class and to his helper for the work he does.

We usually talk over the pupil's day's work with him. It is surprising how quickly he becomes confidential, telling the supervisor of troubles he would never tell the teacher, especially in the presence of his classmates. Certain work must be done by the pupil each day. This is done first, the supervisor suggesting, criticizing, or even giving material help. In a few days the supervisor knows the pupil's weaknesses; he knows what type of things trouble the child; he lets the child know too and recognize that he must overcome certain things and must learn certain portions of the work better. The pupil lists these difficulties himself, and after a few days he knows what to do and how to go about it, even if left to himself.

So much for the classes of pupils. Let us now consider the individual types that come to the study class. They are infinitely more varied, but every school will find each of the types discussed below. We wish to present the method of dealing with these types which we have found most efficacious.

First we have the "helpless" pupil. He comes into the class, sits down, looks around, and if the supervisor is busy waits for him quietly and patiently. His books is closed, his pencil probably in some other room. If left to himself he would apparently sit and wait the entire hour. When the supervisor has met such pupils, day after day, when he has plenty of pupils to consider who are actually working and doing things worth while, he is very likely to feel inclined to let such pupils sit and wait. When he goes to the pupil he will find the attendance blank lying on the desk, in nine cases out of ten not filled out. The pupil simply needs a push and, moreover, a hard push uphill. Usually he is the type who in the hall or on the field is the quickest and most active.

It will never do to ask such a pupil many questions nor even to let him decide for himself. The supervisor should show no hesitation but be decisive. Such a pupil should be told to fill out the attendance blank at once. When the supervisor finds out where he is working he should give him a job as easy as possible at first. He should tell him when that is finished he'll return to him and not until. The main thing is to get him started and at once.

The rest of the situation shapes itself. With each pupil it is an individual problem. And for this reason it must be emphasized that the study-class supervisor must be experienced, must know some psychology, and must be competent. A teacher should not be put there merely for the sake of giving him experience, unless he is really capable. He has to think, and think hard, every day.

Another type of helpless pupil is the one who, when the supervisor comes to him, sticks his books out, points to a theorem or problem, and says, "I don't understand this." This is irritating, as is also the case of the pupil who has been working on a problem several minutes, has a sheet full of figures, and points generally to it saying, "Is this right?"

One should not argue with such a pupil about wasting the supervisor's time. He should be told that the supervisor will return to him in five minutes and by that time he must have a definite question to ask as to his procedure. Until then he must not expect help. This usually works. If it doesn't, the pupil is really "up against it"; but the supervisor soon learns to know and recognize each situation.

Then, too, there is the careless pupil who will always have a set of stock phrases: "This problem won't check"; "This problem can't be done"; "This is impossible"; "There must be a mistake in the book"; etc. He should be assured definitely that it can be worked; it is not impossible, etc.; and if one can do so at a glance he should be shown where he is wrong. This, however, does not remedy the defect of carelessness. But when the pupil is shown his mistake he feels rather small. Then is the time to say a word quietly and firmly about carelessness. We then give such a pupil one or two or more problems of the same type to be worked neatly and presented to the supervisor. By the time he has done this he has overcome that particular type of carelessness. It doesn't take many applications of this medicine to produce careful, painstaking work. Care must be taken not to make the pupil feel that he is being punished, however. The supervisor should not appear venomous. A cheery word, a smile, a pat on the back, will get more than a dozen frowns.

It is not necessary to go into detail about our treatment with each type of pupil. The resourceful supervisor will soon recognize types and know how to deal with them. We shall mention only the following additional clearly defined types, with a word about each: (1) Pupils hopelessly lost, requiring encouragement, cheer, easy work, lots of appreciation. (2) "Smart" pupils, whom it pays to allow to "go ahead" and get "stuck." They usually turn out to be most devoted. (3) Indifferent pupils, who must be dealt with by

the aid of the class teacher. (4) "Sponging" pupils—willing to let the supervisor work the problem. They always move over so that he may have room to write. These pupils are, of course, very easy to handle. (5) "Belligerent" pupils, who are being imposed on by being compelled to attend the class. These need an ultimatum and definite work.

If space permitted we should like to describe many of the typical difficulties we have met regarding particular problems, and particular mathematical ideas. I can only mention a few of these and say that our method of dealing with them and their relative importance and difficulty will be published later in a separate article. These are a few of the things we find hardest for pupils to grasp: (1) use of protractor; (2) addition of monomials having literal coefficients; (3) direct variation and the idea of functionality (even in third-year work); (4) squaring binomials; (5) factoring sum or difference of cubes; (6) solving quadratics by completing the square (the pupils have forgotten fractions); (7) elementary spatial ideas in solid geometry; (8) reduction of radicals (idea of factors); (9) literal equations, especially quadratics; (10) treatment of inequalities on same basis as equations; (11) expressing one thing in terms of another; (12) addition or subtraction of fractions (especially minus signs before fractions). Every mathematics teacher could amplify this list easily. We do not believe, however, that the mere recognition of these difficulties is enough. It is our intention definitely to plan, with our objective experience as a basis, to meet these difficulties, to foresee them in their true proportions, and, as a department to plan to meet them as we have found them best met by experience. In this way as much as in any other we feel that our study class will be of benefit.

The next question that arises is: "Just how is the class conducted; exactly what does the supervisor do each day?" Let us, in answer to this, describe a typical day's work. The

pupils arrive promptly (this is insisted upon) and are required to have as legitimate an excuse for tardiness as for any regular recitation. Upon entering the room the pupil receives the attendance blank, reproduced above. He finds his own seat, unless for some particular reason the supervisor assigns him a definite place. This may be done for the sake of discipline or in order to group pupils doing a particular type of work.

The pupil then fills out his blank and starts work. It takes only a short while for all to learn that they *must* start work—at something—immediately.

The supervisor then starts at one side of the room and stops with every pupil. On this first round the pupils wait their turn, working until the supervisor comes to them. This of course is the ideal situation. As a matter of fact it takes much work with many pupils before they can start by themselves. The supervisor can, however, reduce the idleness at this time to a minimum if he determinedly starts in to do so.

By the time the supervisor has been around the class everyone is working, but each at a different task. Some will require attention again almost immediately, some not for several minutes. The pupils then raise their hands when they want particular help. With skilful work there need be only one or two such at any one time. Thereafter the matter is a mere routine affair, the supervisor being occupied every minute of the time.

A visitor to the class would see a roomful of pupils studying quietly and the supervisor passing here and there, now stopping to question a pupil for a moment, now assigning work, now grouping two or three pupils and explaining some situation. The visitor may be bored, but the supervisor is not—he must be alert, keen, watchful, and sympathetically interested every minute.

All pupils, except those coming voluntarily, remain until the end of the hour. No pupil leaves the room without first speaking to the supervisor and obtaining permission.

As to the problem of discipline: a busy pupil is a good pupil, and the good disciplinarian will keep the pupils not only busy but interested.

The supervisor.—We have already said that the supervisor must be experienced and competent. He must be more than that. Above all else he must know his subject. He must be able to turn his attention quickly and decisively from any one phase of the work to any other immediately. He must, for example, be able to discuss in succession simple, quadratic simultaneous, and simultaneous quadratic equations. He must be able to use logarithms, to factor, or to apply formulas of solid geometry, and do each readily. More than this, he must know the particular problems of the textbooks his pupils are using, and in the case of theorems must be able to see through to the end the method involved.

To illustrate, the supervisor met these four situations in succession in one class hour: (1) Proving two lines parallel because inscribed angles intercepted equal arcs on two tangent circles. (2) Finding the length of a side of a decagon inscribed in a circle, in terms of the radius. (3) Using the tangent ratio in finding distances. (4) Solving a simultaneous equation by determinants.

An ideal supervisor, then, must know what each class in mathematics is doing, must anticipate meeting certain problems, and must have, as far as possible, his method of procedure in each case clearly outlined. This seems like a large task, but it can be systematized remarkably. The supervisor must be capable of doing such systematizing.

He must take care of routine duties, such as checking attendance, preparing assignments for certain regularly "sent" pupils, report to teachers concerning certain pupils, and discuss the situations arising with them. And second only to his preparation he must be enthusiastic, vigorous, awake. He must be a veritable apostle of mathematics; he must remember faces and names; must be generous, sympathetic, and unceas-

ingly firm. He must be confident of himself, decisive, quick both to think and act.

The writer lays no particular claim to any of these excellencies, but he has found that he was and is sadly lacking. He feels further that the study class has taught him more than he can ever give back to the class. He has learned—of necessity—infinitely more than he has taught. This has been the experience of the other teachers, and so it will be with anyone placed in this position—he will need all his training, he will have to work, but the rewards are proportionately larger and more satisfactory. Simply because he *is* dealing with weak pupils, he hears more often than the other teachers, “I never really understood this until now.” You who have taught—mathematics or anything else—can appreciate the inspiration there is in such commendation. The supervisor can make many friends, and these friends will in turn make the supervisor.

Study-class co-ordination.—We have already mentioned the French, German, and English study classes. The fact that we have four such classes early led to their coming in contact with each other regarding the attendance of certain pupils. In the majority of cases a pupil who is exceptionally weak in mathematics will be so in his other work. We found often that when we instructed a pupil to report to study class, he had to attend French or German at the same time. Some pupils were clever enough to tell the French or German teachers the same thing regarding mathematics. As a result they could disregard all study classes, and each teacher would take it for granted they were attending the other teacher’s class. To remedy this the study-class instructors prepared the following exchange slips. When a pupil tells his teacher he must go to another class the teacher gives him slip No. 1 to take to the supervisor of that class, first claiming the pupil for two days of the week. When the pupil is no longer required to attend

one of the classes, slip No. 2 is sent by the teacher concerned to the supervisor of the other class.

The exchange of these slips requires careful consideration and regard for each other on the part of each supervisor, and these supervisors must be really sympathetic and prompt in order for it to be a success. The slips are reproduced below:

No. 1

Date.....

M.....

(Supervisor's Name)

.....will attend (Math., Fr., Ger.)
(Pupil's Name)

class Tues., Wed., Thurs., Fri., each week until further notice.
(Two days to be crossed out)

(Signed).....
Supervisor

No. 2

Date.....

M.....

.....has been excused from
required attendance in.....study class, and
is therefore free to attend.....study class
without interruption.

(Signed).....
Supervisor

The spirit of co-operation has been excellent, and the writer is indebted to Miss Slaught of the French department and to Miss Ballord of the German department for valuable assistance in unifying the work. In this connection we wish to present statements from these two supervisors regarding their work. Miss Slaught's work would make an interesting article in itself. She has worked out a set of instructions that would be valuable to any French study class, and the oral drill she conducts daily in French pronunciation is noteworthy. Miss Slaught has given the writer the following statement regarding her work:

The French study class in purpose and organization is like the other study classes of the school. We aim (1) to teach the student how to study and (2) to help him conquer his particular difficulties.

At least four classes of students are reached: (1) those who must make up lessons they have missed; (2) weak and slow pupils whom we try to train to independent and more rapid accomplishment of assigned tasks; (3) careless students in whom we seek to inculcate a love of good form; and (4) those who are linguistically undeveloped both as to ear and speech.

Weak students bring their home work regularly for correction; one girl by faithful attendance for a few weeks learned to do her own work so well that she raised her grade ten points in that time.

To teach careless students exactness (class 3) we have them reproduce from memory, then correct from the original and write each correction three times. This is then checked over by the teacher; if there are too many mistakes the work is repeated.

To each individual who needs drill in pronunciation (class 4) we give approximately five minutes' attention daily, consisting of syllabic analysis and practice followed by group and rhythm practice with some training in speedy visualizing of sounds. These pupils are almost entirely of the first year.

The study-class experimentation is proving fruitful in results both for students and teacher.

Miss Ballord, supervisor of the German study class, has kindly submitted the following statement:

First, pupils are asked to state definitely what they are to do. If they come to prepare the next day's lesson they are asked to tell what the assignment was.

Next, directions are given each pupil as to the plan of procedure, making sure that each one is provided with the materials necessary for this work.

A pupil reading a text or a group all doing the same reading, after being directed as to method of preparation, are told to study fifteen minutes, or some definite length of time, at the expiration of which they are tested to find out what they have accomplished and incidentally to ascertain where their difficulties lie.

Pupils come to make up defects in grammar, such as adjective declension, prepositions, or principal parts of verbs. They are directed to certain paragraphs in the grammar which they are to study and before the

close of the hour they go to the board and write out some selected exercises in order to show that the difficulties are really cleared away. Sometimes they write an exercise on paper to show the teacher by whom they were sent.

Pupils sent to make up composition work, first study, and then are required to give their work orally or write it on the board, or both, before proceeding to write it on paper.

Weak pupils coming to make up work in which they have failed often imagine they are prepared when they are not. They are tested orally before being allowed to write.

Every pupil before leaving must give evidence in one way or another of what he has accomplished during the period.

To those interested in any particular phase of our work which this article has not made clear we shall be glad to give further information, such as instruction slips, details of technique, etc., if they will write the appropriate department of our high school.

We have not mentioned the procedure in the English classes. This is a new departure, originating this year with Mr. Lasher of the English department. Special classes are held for pupils weak in pronunciation, writing, spelling, and organization. The members of the English department will themselves report on this work at a later date.

Results.—Let us now consider the actual, measurable results achieved by the study class. In presenting the case for the class we shall state merely certain statistical facts tabulated during this school year. The record given here includes 101 days of study-class recitations between October, 1917, and April, 1918. In that time 2,162 attendance records were filled out by students attending the class. These records were filled by 233 separate students. The mathematics department during this time has included nearly 350 students. This means that at one time or another 66 per cent of the mathematics students enrolled in the University High School attended the class.

The largest number of days attended by any one pupil was 64 and the smallest was 2. The average number of days attended by all pupils was $8\frac{1}{2}$. This means that no pupil who once came to the class never came back, and it means also that a very large number of students came voluntarily.

The exact figures as to attendance follow:

Total number of separate attendance.....	2,162
Attendance by "sent" pupils.....	1,650
Voluntary attendance.....	512
Average daily attendance.....	21+
Average daily voluntary students.....	5+
Average daily "sent" students.....	16+
Number different students.....	233
Number different "sent" students.....	84
Number different voluntary students.....	149
Average number days attended by all pupils.....	$8\frac{1}{2}$

The following figures as to class attendance are also interesting. The table shows that the work increases in difficulty as the pupil progresses in the course:

Number Freshman pupils in mathematics classes.....	169
Number Freshman pupils appearing in mathematics study class.....	128
Percentage.....	75
Number Sophomore pupils in mathematics.....	121
Number Sophomore pupils in study class.....	83
Percentage.....	67
Number Junior pupils in mathematics.....	41
Number Junior pupils in study class.....	27
Percentage.....	65
Number Senior pupils in mathematics.....	14
Number of Senior pupils in study class.....	2
Percentage.....	14

The following statistical study of grades of pupils sent from the writer's own first-year classes in mathematics is also enlightening. This record includes ten students who were in study class for ten days each from November 27 to

December 11. These students were selected because they represent a homogeneous group and because two departmental tests were given before and after their study-class attendance. Lest the argument be advanced that the tests were probably of unequal difficulty, and that pupils not in the study class might have achieved the same results, we wish to add that inspection of the fifty pupils in the writer's own classes showed that the variation in the case of those not attending study class was very slight—no more than normally occurs between examinations. The following record of the ten pupils is self-explanatory:

FIRST-YEAR GROUP

Sex	Test of Nov. 23	Test of Dec. 12	Sex	Test of Nov. 23	Test of Dec. 12
	Percentage	Percentage		Percentage	Percentage
Boy.....	49	54	Boy.....	45	65
Girl.....	51	85	Girl.....	58	100
Girl.....	59	100	Girl.....	49	61
Boy.....	50	45	Boy.....	56	85
Girl.....	35	45	Girl.....	41	47

Average increase.....19.4 per cent

In only one case was there a smaller grade on the second test than on the first, and this was in the case of a boy who was sick at the time of the second test. The largest gain, from 58 per cent to 100 per cent, was made by a girl whose first low grade was due to absence. All the other cases are cases where the work done in the study class actually boosted the pupil as shown. In the first test every pupil failed; in the second four failed; and all of these materially bettered their grade except the one mentioned above.

The following table represents the records of seven second-year pupils attending study class at approximately the same time—another homogeneous group under the same teacher. The result is practically the same as with the first-year pupils.

SECOND-YEAR GROUP

Sex	Test of Dec. 7	Test of Dec. 21	Sex	Test of Dec. 7	Test of Dec. 21
	Percentage	Percentage		Percentage	Percentage
Boy.....	68	70	Boy.....	50	78
Boy.....	63	85	Boy.....	30	68
Boy.....	60	61	Girl.....	40	75
Girl.....	51	60			

Average increase.....18 per cent

In the first-year group five were retained in study class longer, and all ultimately left it, passing their examinations satisfactorily. In the second-year group only two were retained, and they for only a few days. All the pupils listed above were in good standing in their classes by the middle of January.

The writer admits that such meager evidence does not prove a great deal, but he has found the gathering of tabulated statistical data very difficult. He and all his colleagues, however, can mention innumerable individual instances of such improvement as was shown in the collective list given above. Moreover, in considering improvement in a pupil there are many more, and perhaps more important, things to be considered than the pupil's grade in successive examinations. One must consider the pupil's attitude, his class activity, his relative standing in the class, his habits of study, etc.

If space permitted it would perhaps be interesting to cite individual cases coming to the department's attention of changed attitudes, improvements of various types, etc. We can only say definitely that we know that each year we save to the school a number of potential flunkers and help them on the way to successful graduation. We know also that the percentage of failures in mathematics is as nearly normal as is possible to be secured.

Since we have come to consider opinion that is in a way "subjective," the writer wishes to present formally the opinions of three different types of people, representing the attitude toward the study class, namely, the men of the mathematics department, the pupils, and the supervisor himself.

The men of the department are unanimous in taking advantage of the study class for their pupils and in commending it. They agree definitely that pupils are benefited by it and none of them would agree to its being discontinued. The only adverse criticism given was by one of the department who said that several of his pupils would go to study class, improve, be released from required attendance, and then gradually slip back to their old position, when they would again be sent to study class. The writer can hardly consider this a real criticism of the study class. It is not a place to be born again; it is a hospital, and the permanence of the cure depends to a great extent on the constitution of the patient. At any rate the fee is small and the treatment can be tried whenever pronounced weakness sets in.

As for the pupils, the way they attend seems to be sufficient evidence of their attitude. The supervisor could quote from dozens who have had *real* help, and if commendation from pupils is an evidence of success the study class has really succeeded.

The supervisor himself feels that he is in the center of things when in the study class. Here he sees the mathematics courses laid bare, analyzed, vivisected. And he would rather have one year's experience in the study class than five of ordinary teaching if he wished to be really prepared to handle work in mathematics. He knows more mathematics, more human nature, and has more friends than he could possibly make in any other position in the school. Consequently we should recommend that different teachers be given opportunity in different years, each benefiting from the former's experience.

One warning in conclusion: the study class must not become a "lazy student's" refuge. The supervisor must never work a problem he can make the pupil work, must never even contribute an idea that he can get from the pupil. Many pupils have come to the study class seeming to expect someone there to do their work. They have been disappointed in this without exception, but the supervisor has some excellent opportunities even in the task of undeceiving such pupils.

Your study class will not run smoothly for a long time. We have met many difficulties, but we feel that our class is established, is an institution in itself. If we aid others over some of the rough places by our suggestions in this article we shall be amply repaid.